openreach

SIN 369 Part B

Issue 1.4

December 2025

Suppliers' Information Note

For The Openreach Network

Protocol Implementation Conformance Statements (PICS) for ISDN 2e: Basic Access - Layer 1

TECHNICAL INFORMATION FOR SUPPLIERS & Withdrawal Notification

Each SIN is the copyright of British Telecommunications plc. Reproduction of the SIN is permitted only in its entirety, to disseminate information on the Openreach Network within your organisation. You must not edit or amend any SIN or reproduce extracts. You must not remove Openreach trademarks, notices, headings or copyright markings.

This document does not form a part of any contract with Openreach customers or suppliers.

Users of this document should not rely solely on the information in this document but should carry out their own tests to satisfy themselves that terminal equipment will work with the Openreach network.

Openreach reserves the right to amend or replace any or all of the information in this document.

Openreach shall have no liability in contract, tort or otherwise for any loss or damage, however arising from use of, or reliance upon, the information in this document by any person.

Due to technological limitations a very small percentage of customer interfaces may not comply with some of the individual characteristics which may be defined in this document.

Publication of this Suppliers' Information Note does not give or imply any licence to any intellectual property rights belonging to British Telecommunications plc or others. It is your sole responsibility to obtain any licences, permissions or consents which may be necessary if you choose to act on the information supplied in the SIN.

Those BT services marked ® indicates it is a registered trademark of British Telecommunications plc.

Those BT services marked ™ indicates it is a trademark of British Telecommunications plc.

This SIN is available in Portable Document Format (pdf) from:
https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do
Enquiries relating to this document should be directed to: orsinsfa@openreach.co.uk

Openreach Confidential
Openreach logo are trademarks of British Telecommunications plc. © British Telecommunications plc 2025. Openreach Limited, Registered office: 6 Gracechurch Street, London EC3V 0AT.Registered in England and Wales no. 10690039

1. Introduction

This document states the capabilities and options of the DSS1 Layer 1 protocol for the basic access interface which has been implemented in the ISDN 2e network.

The ETSI protocol specification used as a basis for this PICS proforma is ETS 300 012-1, Edition 2, October 1998.

The ETSI PICS proforma used as a basis for this PICS is ETS 300 012-3, Edition 2, October 1998

Openreach will withdraw the ISDN 2e Basic Access service by end of January 2027 in line with the closure of the BT UK PSTN.

2. References

1	ETS 300 (1998)	012-1	Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Part 1: Layer 1 specification
2	ETS 300 (1998)	012-3	Integrated Services Digital Network (ISDN); Primary rate User-Network Interface (UNI); Basic User-Network Interface (UNI); Part 3: Implementation Conformance Statement (ICS) and Implementation eXtra Information for Testing (IXIT) specification for interface IB

For further information or copies of referenced sources, please see document sources at https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do

3. Protocol Implementation Conformance Statement (PICS)

Using the relevant standard (see ref. 2), the PICS is given below. The section and table numbering as used in the ETSI standard has been maintained. Only those parts of the standard relevant to the network implementation are given. For guidance on the abbreviations and meaning of the completed PICS tables, see SIN 369, Part A.

Unless stated otherwise, the standard referred to in the **reference** column is the ETS given in reference 1. For glossary of terms used, see the referenced standards [1, 2].

A.6.2 Tables

Table A.1: Optional capabilities

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Predicate	Support
	NT can be connected to user premises wiring:	clauses 1 and 3, 5.1.3, 5.2.2			

1	- at reference point T or S/T: NT type is "NT1";		o.1		Y
2	- at reference point S: NT type is "NT2" (or "NT2+NT1");		o		N
3	- directly without a detachable cord;		o		N
4	- by means of a hard wired cord ≤ 3 m and a plug;		o		N
Item No.	**Item**	**Reference ETS 300 012-1 [1]**	**Status**	**Predicate**	**Support**
5	- by means of a jack with a cord ≤ 3 m and a plug at each end;		o		Y see note 1
6	- with the terminating resistor included in the NT.		o		Y
	Timer T2 value is:	7.5			
7	- 0 (if NT recognizes INFO 1 unambiguously);	(table 8)	o	not A.1/8	N
8	- 25 ms to 100 ms.		o	not A.1/7	Y
	NT configuration is designed for:				
9	- short passive bus (fixed timing);	9.6.2.2	o		Y
10	- both point-to-point and short passive bus (adaptive timing);	9.6.2.3	o		Y
11	- extended bus;	9.6.2.4	o		Y
12	- point-to-point only.	9.6.2.5	o		N
13	Power source 1 (PS1) is provided:	10.1, 10.1.2,	o		Y
14	- as an integral part of NT;	10.2.1	o		Y
15	- physically separated from NT (Auxiliary Power Source (APS));	10.8	o.1		Y see note 2
16	- for normal power mode, fall back characteristics;	10.6.5.2. a)	c	A.1/14 or A.1/15 and not A.1/17	N
17	- for normal power mode, switch-off/switch-on characteristics;	10.6.5.2. b)	c	A.1/14 or A.1/15 and not A.1/16	N
18	- for restricted power mode;	10.2.1 iii)	o		Y
19	- for power feeding of more than one TE.	10.6.5.4.2	o.2		N
20	Power source 2 (PS2) is provided:	10.1, 10.1.2,	o		N
21	- as an integral part of NT;	10.2.1	o		N
22	- physically separated from NT;		o		
23	- for normal power mode;	10.3.2.1	c	A.1/20	N
24	- for restricted power mode.	10.3.2.2	o		N
	If items A.1/1 and A.1/15 are supported:				
25	- NT1 associated with the APS contains normal mode voltage detector for switching-off the restricted mode power source.	10.9.3 10.9.1	m	A.1/1 and A.1/15	Y
	If item A.1/2 is supported:				
26	- NT2 provides multiframing.	8.3, D.5	o.3	A.1/2	

o.1	If items A.1/1 and A.1/15 are supported, the NT1 associated with APS shall not have a PS1 normal mode source.
o.2	If supported, state the maximum number of TEs to be fed from PS1.
o.3	If supported, state in the PIXIT whether there is a difference to subclause 8.3 of ETS 300 012-1 [1].

Note 1: The cord is not supplied.
Note 2: PS1 normal mode is possible with an additional APS (not supplied).

Table A.2: Major functional characteristics

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	Two bi-directional 64 kbit/s B-channels are provided.	6.1.1	m	Y
2	Bit timing takes place at 192 kbit/s.	6.1.2	m	Y
3	Octet timing takes place at 8 kHz.	6.1.3	m	Y
4	Frame alignment.	6.1.4	see table A.3	
5	One D-channel for each direction is provided at 16 kbit/s.	6.1.5	m	Y
6	D-channel access.	6.1.6	see table A.4	
7	Power transfer across the interface is possible.	6.1.7	m	Y
8	Deactivation/activation.	6.1.8, 6.1.9	see table A.5	
9	Two interchange circuits, one for each direction, are provided.	6.2	m	Y
10	Each transmitted frame contains 49 bits for all configurations.	6.4	m	Y
11	Nominal transmitted bit rate is 192 kbit/s.	6.4.1	m	Y
12	Binary organization of the transmitted frame meets the requirements.	6.4.2	m	Y
13	Contents and grouping of the transmitted frame meets the requirements	6.4.2.2	m	Y
14	Pseudo-ternary line code is used.	6.5	m	Y
15	NT timing is derived from the network clock.	6.6	m	Y

Table A.3: Frame alignment

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	Frame alignment procedure, based on line code violation, is used.	8	m	Y
2	Frame alignment, on initial activation of NT, meets the requirements.	8.2	m	Y
3	Loss of frame alignment is assumed on the required criterion.	8.2.1	m	Y
4	Frame alignment is assumed on the required criterion.	8.2.2	m	Y
5	NT1 multiframing is not provided (F_A bit is set to binary ZERO).	8.3	c1	Y
c1	Predicate: A.1/1.			

Table A.4: D-channel access

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Predicate	Support
1	Interframe (layer 2) time fill is provided using: - binary ONEs;	7.1.1	c	not A.4/2	N
2	- HDLC flags.		c	not A.4/1	Y
3	D-echo channel is provided.	7.1.2	m		Y

Table A.5: Deactivation/activation

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	NT uses the following states as required: - G1 (deactive);	3.1.5.2.1	m	Y
2	- G2 (pending activation);	3.1.5.2.2	m	Y
3	- G3 (active);	3.1.5.2.3	m	Y
4	- G4 (pending deactivation).	3.1.5.2.4	m	Y
5	Activate primitives correspond to the specification.	7.2.1	m	Y
6	Deactivate primitives correspond to the specification.	7.2.2	m	Y
7	Management primitives correspond to the specification.	7.2.3	m	Y
8	Signals INFO 0, INFO 2, INFO 4 can be sent.	7.3	m	Y
9	Signals INFO 0, INFO 1, INFO 3 can be received.		m	Y
10	Activation/deactivation of activating/deactivating NT meets the requirements.	7.5	m	Y
11	Timer T1 is present.	7.6	m	Y
12	Activation time in state G1 (deactive) meets the requirements (respond to INFO 1 by sending of INFO 2 normally within 1 s, abnormally within 30 s.	7.7.2	m	Y
13	Activation time in state G2 (pending activation) meets the requirements (respond to INFO 3 by sending of INFO 4 normally within 100 ms, abnormally within 15 s if "Da"+"Db" is not greater than 30 s).		m	Y
14	Deactivation time meets the requirements (respond to INFO 0 or loss of synchronization by sending of INFO 2 within 25 ms).	7.8	m	Y

Table A.6: Electrical characteristics

Item No.	Item	Reference ETS 300 012-1[1]	Status	Predicate	Support
1	Nominal bit rate is 192 kbit/s.	9.1.1	m		Y
2	Bit rate tolerance is ± 100 ppm.	9.1.2	m		Y
3	Maximum output jitter is 5 % of a bit period.	9.3	m		Y
4	Transmitter output impedance is: - at all times, except when transmitting a binary ZERO, from 2 kHz to 1 MHz: Exceeding the impedance indicated by the template in figure 11;	9.5.1,	m		Y
5	- when transmitting a binary ZERO: ≥ 20 Ω.	9.5.1.2 b)	m		Y
6	Pulse shape is within the mask of figure 13.	9.5.3.1	m		Y
7	Nominal pulse amplitude is 750 mV, zero to peak.	9.5.3.2	m		Y
8	Pulse amplitude when transmitting a high density pattern meets the requirements.	9.5.4.1	m		Y
9	Pulse unbalance of an isolated couple of pulses meets the requirements.	9.5.4.2	m		Y
10	Longitudinal conversion loss of transmitter output is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	9.5.6, 9.5.6.1	m		Y
11	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m		Y

(continued)

Table A.6 (concluded): Electrical characteristics

Item No.	Item	Reference ETS 300 012-1[1]	Status	Predicate	Support
12	Receiver input impedance at all times is: - from 2 kHz to 1 MHz: exceeding the impedance indicated by the template in figure 11;	9.6.1.2	m		Y
13	- at 96 kHz: peak current resulting from applied 1,2 V does not exceed 0,5 mA.		m		Y
14	Receiver sensitivity - noise and distortion immunity: NT operates over the specified full waveform mask range for NT designed for: - short passive bus (fixed timing);	9.6.2, 9.6.2.2	c	A.1/9	Y
15	- both point-to-point and short passive bus (adaptive timing);	9.6.2.3	c	A.1/10	Y
16	- extended passive bus;	9.6.2.4	c	A.1/11	Y
17	- point to-point only.	9.6.2.5	c	A.1/12	N
18	Receiver input delay: The receiver accommodates the specified round trip delays for NT designed for: - short passive bus: 10 μs to 14 μs;	9.6.3, 9.6.3.1	c	A.1/9	Y
19	- both point-to-point: 10 μs to 13 μs; and passive bus: 10 μs to 42 μs;	9.6.3.2	c	A.1/10	Y
20	- extended passive bus: 10 μs to 42 μs;	9.6.3.3	c	A.1/11	Y
21	- point to-point only: 10 μs to 42 μs;	9.6.3.4	c	A.1/12	N (note)
22	Longitudinal conversion loss of receiver input is: - 10 kHz ≤ f ≤ 300 kHz: ≥ 54 dB;	9.6.4	m		Y
23	- 300 kHz < f ≤ 1 MHz: minimum value decreasing from 54 dB at 20 dB/decade.		m		Y

Note: Some, but not all, BT network implementations support this feature.

Table A.7: "Static" power feeding

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Predicate	Support
1	PS1 restricted operation is indicated by polarity reversion.	10.2.1 ii)	c	A.1/18	Y
2	Change from normal to restricted power mode takes place at the specified criteria.	10.2.1 iii)	c	A.1/16-17 or A.1/18	Y
3	NT provided power from: - PS1 normal mode is: 40 V +5/-15 % up to the maximum available power (at least 1 W);	10.2.2.1	c	A.1/16 or 17	N
4	- PS1 restricted mode is: 40 V +5/-15 % up to 420 mW;	10.2.2.2	c	A.1/18	Y
5	- PS2 normal mode is: 40 V +5/-20 % at TE when TE draws up to the min. available power of 7 W;	10.2.3, 10.3.2.1	c	A.1/23	N
6	- PS2 restricted mode is: 40 V +5/-20 % at TE when TE draws up to the min. available power of 2 W.	10.2.3, 10.3.2.2	c	A.1/24	N

Table A.8: "Dynamic" power feeding

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Predicate	Support
1	Power source switch-over time is < 5 ms.	10.6.3.1	c	A.1/ 16-17 and 18 or A.1/23 and 24	N
2	Restricted mode power source meets the requirements under overload conditions.	10.6.3.2	c	A.1/18 or 24	Y
3	Increase of output voltage after removal of short circuit meets the requirements for: - PS1 restricted mode;	10.6.5, 10.6.5.1	c	A.1/18	Y
4	- PS1 normal mode, limiting the output current.	10.6.5.3	c	A.1/16	N
5	Switch-on surge capability meets the requirements.	10.6.5.4.1	c	A.1/ 16 or 17 or A.1/23	N
6	PS1 operates as required for TE connection surge current.	10.6.5.4.2	c		N
7	dc unbalance of PS1 is < 3 %.	7.2.1.1	c	A.1/13	Y
8	NT meets the requirements when 3 % external dc unbalance is adjusted and maximum power is drawn from PS1.	10.7.2	c	A.1/13	Y

Table A.9: Additional capabilities for APS

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	Power available from APS is 1 W per terminal multiplied by loading factor (minimum 1,1 or 1,5 if la on a short passive bus is used for connection).	10.8.1	c1	N
2	APS switch-on time is < 2,5 ms.	10.8.2	c1	N
3	APS switch-off time is < 2,5 ms.	10.8.3	c1	N
4	APS power consumption from PS1 restricted mode when off is ≤ 3 mW.	10.8.4	c1	N
5	APS meets the requirements when the number of connected terminals is one more than supported nominally.	10.8.5	c1	N
6	NT1 associated/compatible with the APS: - does not have a PS1 normal mode source;	10.9	c1	Y
7	- backs-off to restricted mode: from 5 μs to 100 ms: < 45 mA, then: ≤ 3 mW/< 45 mA;	10.9.1	c1	Y
8	- powers-up to restricted mode: rise time from 2-5 V to ≥ 34 ≤ 42 V: < 2,5 ms, in the range 34-42 V after further < 2,5 ms;	10.9.2	c1	Y
9	- consumes ≤ 3 mW from APS in normal mode when I_B voltage is 24 V to 42 V.	10.9.3	c1	Y
c1	Predicate: A.1/1 and A.1/15.			

Table A.10: Interface connector and contact assignments

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	Functions at access leads meet the requirements.	10.1, 10.1.1	m	Y
2	Leads or/and contact assignments meet the requirements.	11	m	Y

Table A.11: Maintenance

Item No.	Item	Reference ETS 300 012-1 [1]	Status	Support
1	A transparent loopback of B1 and B2 channels is provided (for conformance test purposes).	Annex C	o	Y

4. History

Issue 1	November 2000	First Issue
Issue 1.1	November 2006	Addition of note against Item 21 in Table 6.
Issue 1.2	July 2014	Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 1.3	October 2020	Changes to branding, from BT to Openreach including changes to reflect new Openreach SIN site and Openreach SIN email address
Issue 1.3	October 2021	Annual Review – no changes required – issue remains unchanged.
Issue 1.3	October 2022	Annual Review – branding and font changes only – issue remains unchanged.
Issue 1.3	October 2023	Annual Review – branding and font changes only – issue remains unchanged.
Issue 1.4	December 2025	Withdrawal notification added to the introduction section.

-END-